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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,214	12/18/2001	Alper Tunga Erdogan	56162.000322	5754

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EXAMINER
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GHULAMALI, QUTBUDDIN

ART UNIT	PAPER NUMBER
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2637

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/020,214

Applicant(s)

ERDOGAN, ALPER TUNGA

Examiner

Qutub Ghulamali

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 17-27 and 40-47 is/are rejected.
- 7) ☒ Claim(s) 9-16 and 29-39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/24/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1 and 43 are objected to because of the following informalities: Claims 1 and 43, lines 5 and 1 respectively, recites "TEQ". The first use of this abbreviation must be spelled out in order to mitigate misinterpretation of the term used in the claimed invention. Additionally in claim 1, line 5, it is not clear what "inpur signal" means. Correction is required.
2. In claim 1, lines 11 and 12, the use of colons and commas are required to be deleted from the claimed subject matter.
3. Regarding claim 40, it is not clear what "h" and "d" referring to. A description must be provided wherever such terms are used in the claims, for example in claim 23, the term "TIR".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-8, 17-20, 21-27, 40-47 are rejected under 35 U.S.C. 102 (e) as being anticipated by Fertner (USP 6,408,022).

Regarding claims 1, 22, 43 Fertner discloses a method (procedure) for determining a finite impulse response time domain equalization filter for shortening a channel impulse response in an asymmetric multi rate transmission system comprising:

sampling  $y_p$  (col. 1, lines 50-54);

applying a delay channel ( $d$ ) (tap delay), which is based at least in part on transmitted signal  $x_k$ , with a target channel vector  $b$ , which is constrained so as to avoid an all-zeros solution (col. 5, lines 66-67; col. 6, lines 1-35); and

calculating a vector  $w$  so as to minimize the error  $e_k$  (negative effects) between a shortened channel impulse response  $z_k$  and the target channel impulse response (col. 5, lines 50-67; col. 6, lines 1-14).

Regarding claim 2, Fertner discloses  $y_k$  has an overall effective length  $N_c$  and an effective delay channel ( $d$ ) (col. 7, lines 60-67).

Regarding claim 3, Fertner discloses the effective delay channel  $d$  corresponds to the starting location of the non-zero segment of the channel impulse response (col. 6, lines 1-14).

Regarding claim 4, Fertner discloses a channel length of  $N_{TEQ}$  that is modeled to match desired target channel length  $N_T$  of the target channel impulse response (col. 7, lines 34-40).

Regarding claim 5, Fertner discloses channel impulse response  $h_k$  comprises one or more replicates of a received data set (col. 4, lines 54-67)

Regarding claim 6, Fertner discloses transmitted signal  $x_k$  is a received signal in a communications system (abstract; col. Col. 4, lines 19-40).

Regarding claim 7, Fertner discloses the said communications system is a Discrete Multi tone (DMT) communications system (col. 1, lines 18-30).

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Regarding claims 17, 24-26, 40 and 41, Fertner discloses the filter coefficients  $w_k$  are calculated using a Minimum Mean Square Error Linearly Constrained TEQ (MLC-TEQ) algorithm for minimization of error function (col. 11, lines 35-45).

Regarding claim 18, Fertner discloses the channel impulse response is converted into an impulse response that has effectively  $N_p$  nonzero entities (abstract; col. 2, lines 33-36).

Regarding claim 19, Fertner discloses modeling nonzero entities (impulse) with the target impulse response coefficient sequence (see col. 1, lines 50-65; col. 4, lines 58-65; col. 5, lines 1-5; col. 7, lines 16-24, 55-67).

Regarding claims 20 and 40, Fertner discloses formulating target channel using the Krakovian structure disclosed in (27) (col. 10, lines 30-50).

Regarding claims 21 and 47, Fertner discloses the step of constraining any one element of the  $b$  vector to be equal to a constant (col. 9, lines 60-67).

Regarding claim 23, Fertner discloses said error is calculated using the difference between the TEQ filter output and the CIR output (abstract; col. 2, lines 30-46).

With reference to claim 27, Fertner discloses TEQ filter coefficients are parameterized by two (numerous) quantities (col. 1, lines 44-49).

Regarding claim 43, the steps claimed as a device is nothing more than restating the function of the specific components of the apparatus as claimed and therefore, it would have been obvious, considering the aforementioned rejection for the method claim 1 above.

Regarding claim 44, Fertner discloses the shortened channel impulse response  $z_k$  is derived at least in part by calculating a vector  $w_T$  (col. 11, lines 55-60).

Regarding claim 45, Fertner discloses TEQ filter is part of a modem (see the abstract).

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Regarding claim 46, Fertner discloses the transmitted signal,  $x_k$ , received by the TEQ filter through the channel  $h$  and distorted by the disturbance vector,  $v_k$ , originates from a modem device (col. 5, lines 66-67; col. 6, lines 1-15).

*Allowable Subject Matter*

6. Claims 9-16, 28-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

**US Patents:**

Arad et al (USP 6,320,901) shows a method for fast off-line training for discrete multi tone transmissions.

Limberg (USP 6,301,312) discloses a band-pass phase tracker with Hilbert transformation.

Kao (USP 6,292,515) discloses a dual mode bit and gain loading circuit and process for ADSL protocols.

Vareljian (USP 6,480,532) discloses an echo cancellation for an ADSL Modem.

**Publications:**

PETER J.W. MELSA, "Impulse Resmense Shodening For Discrete Multitone Transceive", IEEE Transactions On Communications, Vol. 44, No. 12. December 1996, pages 1662-1672.

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NAOFAL AL-DHAHIR, et al, "Optimum Finite Length Equalization For Multicarrier Transceiver", IEEE Transactions On Communications, Vol. 44, No. 1, January 1996, pages 54-64.

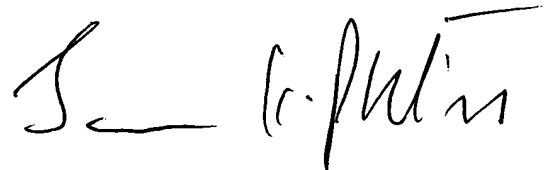
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (571) 272-3014.

The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

QG.  
August 11, 2005.

A handwritten signature in black ink, appearing to read "J. K. Patel", with a stylized flourish at the end.

**JAY K. PATEL**  
**SUPERVISORY PATENT EXAMINER**